



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,193	08/08/2003	Wolfgang Henke	P2002,0659	3960
24131	7590	04/07/2006	EXAMINER	
LERNER GREENBERG STEMER LLP P O BOX 2480 HOLLYWOOD, FL 33022-2480			CHACKO DAVIS, DABORAH	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

CS

Office Action Summary	Application No.	Applicant(s)	
	10/637,193	HENKE ET AL.	
	Examiner	Art Unit	
	Daborah Chacko-Davis	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 9-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>08/03, 10/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-8, in the reply filed on February 17, 2006, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 9-12, are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected invention, there being no allowable generic or linking claim.

Information Disclosure Statement

3. The information disclosure statement filed October 25, 2004, fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language viz., "laser", Stuttgart, 1989, pp8-17, (F. K. Kneubühl et al); and "laserphysik-Skriptum zur Vorlesung", Rheinisch-Westfälische Technische Hochschule Aachen, February 23, 1998, pp. 148-154 (Hans-Jörg Kull). It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1756

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1-2, 5-8, are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent No. 6,094,305 (Shiraishi).

Shiraishi, in col 7, lines 54-67, in col 8, lines 1-64, in col 9, lines 28-67, in col 10, lines 1-32, in col 11, lines 1-14, and lines 55-64, discloses a method of using an illumination source in an exposure apparatus comprising a reticle stage, a mirror, a lens system, and a wafer placed on a wafer stage (substrate plane), providing a reticle that has an opaque layer on one side (chromium films), and aperture openings on the other side (slit, second side), illuminating the opaque layer (dielectric thin films) to form an interference pattern of the opening on the mask, imaging the interference pattern via a projection optical system and focusing and projecting the image onto the wafer and characterizing the illumination source (respective light components) based on the pattern image formed. Shiraishi, in col 5, lines 7-45, in col 16, lines 37-67, in col 17, lines 1-44, in col 22, lines 4-16, discloses determining the contrast of the interference fringes (interference pattern) from the image pattern formed on the wafer, estimating a contrast function (a variable "a") from the width of the openings (transmitting openings) (distance between the slits), and the contrast determined, determining the intensity distribution of light based on a Fourier transform plane with respect to a pattern of the mask (claims 1-2, 5, and 8). Shiraishi, in col 7, lines 55-67, in col 11, lines 16-30, in col 16, lines 57-60, discloses determining the wavelength of the light generated by the illumination source, determining the NA of the optical system, performing illumination via

Art Unit: 1756

a mask wherein the thickness of the opaque layer (pitch, thickness of the thin dielectric film), and the width (W) of the openings (slit width, and/or the distance between the openings) are adjusted such that ratio of i) the width to the pitch (thickness) or ii) the distance to the depth of the patterns in the mask is less than the wavelength employed (claims 6-7).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,094,305 (Shiraishi) in view of U. S. Patent No. 4,885,232 (Spak).

Shiraishi is discussed in paragraph no. 5.

Shiraishi, in col 1, lines 16-22, in col 18, lines 11-51, discloses that a positive photoresist coated wafer is photolithographically patterned (exposed, developed, exposed portions removed to form a pattern, recording of the image signal) (claim 3).

The difference between the claims and Shiraishi is that Shiraishi does not disclose that the height profile of the unexposed portions of the photoresist is subsequently measured with a microscope.

Spak, in col 7, lines 14-49, discloses that the surface profilometry of the patterned positive photoresist is observed through a microscope.

Therefore, it would be obvious to a skilled artisan to modify Shiraishi by employing the method of measuring the wall profile of the patterned photoresist as taught by Spak because Spak, in col 7, lines 32-49, discloses that the microscope enables the observation of the micron size lines (pattern) at a magnification of 10,000 times, and enables comparisons of the different lines and their irregularities in slope or size produced at different exposure parameters.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,094,305 (Shiraishi) in view of U. S. Patent No. 6,699,628 (Shima).

Shiraishi is discussed in paragraph no. 5.

The difference between the claims and Shiraishi is that Shiraishi does not disclose that a sensor is moved in the substrate plane during the imaging process (recording of the image signal) (claim 4).

Shima, in col 7, lines 45-58, in col 8, lines 20-35, discloses that during the exposure processing (imaging the wafer via a mask) an interferometer (a sensor, reference 18 of figure 1, detector) is positioned parallel to the wafer surface near the wafer stage (in the substrate plane).

Therefore, it would be obvious to a skilled artisan to modify Shiraishi by employing the interferometer suggested by Shima because Shima, in col 8, lines 20-26, discloses that the interferometer positioned proximate the substrate stage enables the constant detection of the wafer stage in an X-Y plane at a resolution of about 0.01 μ .

Conclusion

Art Unit: 1756

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd



April 4, 2006.


JOHN A. MCPHERSON
PRIMARY EXAMINER